

Policy & Procedure (P&P)

Policy Title :

Guidelines of Blood Transfusion Practice

Department	Index No.	Scope
Laboratory & Blood Bank	LAB-094	All Blood Bank Staff
Issue Date	Revision NO	Effective Date
1432/5/24	3	1441/7/19
Review Due Date	Related Standard NO.	Page Number#
1443/7/19	CBAHI (LB.66)	12

01. Policy:

The follow of national guidelines for clinical use of blood and blood products will lead to the appropriate and correct use of blood and blood product and will reduce the unnecessary transfusion adverse reaction and avoid wastage.

02. Definition :

N/A

03. Purpose :

This policy aims to proper usage of blood and blood components to reduce the unnecessary transfusion adverse reaction and avoid wastage.

04. Procedure :

04.1. The available blood & blood product in our Blood Bank is:

- 04.1.1. Packed red blood cells.
- 04.1.2. Leukodepleted red blood cells
- 04.1.3. Whole blood.
- 04.1.4. Fresh frozen plasma.
- 04.1.5. Platelets concentrate
- 04.1.6. Platelets apheresis



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04.1.7. Cryoprecipitate

04.2. Blood products not available but can be requested from outside facility

04.2.1. Irradiated blood

04.2.2. Washed RBCs

A) **Packed red blood cells (PRBCs)**

Indication:

1. **In acute blood loss:**

A) If amount of blood is:

- a) 15% with severe cardiac or respiratory disease.
- b) 15-30% with preexisting anemia or with continuous bleeding.
- c) >30% blood loss.

B) If hemoglobin concentration is:

- a) <7gm/dl.
- b) <8 gm/dl in elderly with cardiovascular or respiratory disease.

2. **Anemia in critical case**

- a) We give crystalloids.
- b) Transfuse if Hb < 7 gm/dl.

3. **Preoperative transfusion**

- a) Treatment of cause of anemia.
- b) Avoid causes of bleeding:
 - Reverse anticoagulants.
 - Stop antiplatelet drugs.
 - Give medication to stop surgical bleeding.

4. **Chronic anemia:**

- a) Treatment of cause of anemia.
- b) Erythropoietin therapy:

Indication: patient with cancer, Myeloma, Myelodysplasia and Non-Hodgkin's lymphoma.

Disadvantage: expensive.

c) Beta-Thalassemia:

- Hb. Level should be maintained at more than 9.5 gm/dl.

d) Sick cell disease: transfuse with sickle test negative blood

-If Hb less than 7 gm/dl.

-If Hb less than 10 gm/dl in cases with:

Cerebrovascular accidents or at high risk.

Acute chest or abdominal syndrome.

Pre-operative for major surgery.

Pregnancy.

Priapism.

Dose:

1. One unit of PRBCs will increase Hb by 1 gm/dl & HCT by 3% in adult.
2. In pediatric patients: 10 ml/kg. will rise Hb by 2 gm/dl & Hct by 6%.

Volume of RBCs = required increment in Hb g/dl by 4 by child's body weight

Fresh blood

Description:

1. Less than 14 days old.
2. Maintain coagulation factors & 2,3DPG enzyme level.
3. Less K, uric acid, citrate, phosphate & lactate.

Indication:

1. Neonatal exchange transfusion.
2. Infants with complex cardiac surgery (48 hours old)

Sickling test negative PRBCs

Description:

PRBCs where the sickling test was performed and is negative

Indication:

1. Neonatal transfusion.
2. Sick cell disease patients

Acceptable blood group of red cells for transfusion:

Patient blood group	First choice	Acceptable alternative
O +ve	O +ve	O neg
O neg	O neg	-
A+ve	A+ve	A-ve, O+ve, O neg
A neg	A neg	Oneg
B+ve	B+ve	Bneg, O+ve, Oneg
B neg	B neg	Oneg
AB+ve	AB+ve	ABneg, A+ve, B+ve, O+veAneg, Bneg, Oneg
AB neg	AB neg	Aneg, Bneg, Oneg

B/ Platelet concentrate (P.C)

Description:

1. Volume: 50-70 ml/unite.
2. Platelet count: >5.5 by 10¹⁰/unite.
3. storage: 20-24 degree centigrade.
4. Life span: 5 days.

Indication: -

1. If platelet count less than 10.000/ul in the following cases: -
 - a) Chronic stable thrombocytopenia (no bleeding).

1. If platelet count less than 10.000/ul in the following cases: -
 - a) Chronic stable thrombocytopenia (no bleeding).
 - b) Acute leukemia patient without fever or bleeding.
 - c) Hematopoietic stem cell transplantation.
2. If platelet count less than 20.000/ul in the following cases: -
 - a) Patient with bone marrow failure due to disease, chemotherapy or irradiation.
 - b) Acute promyelocytic leukemia.
3. If platelet count less than 50,000/ul in the following cases: -
 - a) Thrombopenia with active bleeding.
 - b) Emergency surgery.
 - c) Cardiopulmonary bypass with excessive post-operative bleeding.
 - d) After massive transfusion with acute bleeding.
 - e) DIC patient with bleeding.
4. If platelet count less than 100,000/ul in the following cases: -
 - a) Brain or eye surgery.
 - b) Patient with multiple trauma after massive blood transfusion
 - c) NICU.
5. As prophylactic in liver transplant surgery.
6. Congenital or acquired platelet functional disorder.
7. Immune thrombocytopenia transfuse platelet in:
 - a) Life threatening bleeding with support of methyl prednisone and IVIG.
 - b) Neonatal alloimmune thrombocytopenia (NAIT).
 - c) Post transfusion purpura with bleeding with support of IVIG.

N.B: In case of congenital & acquired platelet, functional disorder does:

1. Alternative measure: -
 - a) Withdraw antiplatelet drug.
 - b) Correct the cause of dysfunction.
 - c) Use erythropoietin to increase HCT more than 30% in patient with renal failure.
 - d) Use desmopressin in patient with storage pool disease.

2. platelet concentrate transfusion if the above fail.
 - a) Should be HLA matched.
 - b) Preoperative in patient with Glanzmann's thrombasthenia.

N.B: In case of DIC:

- a) First treat the cause.
- b) No platelet transfusion in chronic DIC without bleeding.
- c) Platelet concentrate can be given with bleeding & platelet count $<50,000/\text{ul}$.

Contraindication:

1. TTP, ITP, Post-transfusion purpura without bleeding or heparin- induced thrombocytopenia.
2. Untreated DIC, thrombocytopenia caused by septicemia or hypersplenism, unless there is active bleeding and must be under clinical monitoring.

Dose:

1. One-unit random platelet will increase platelet count by $5000-10,000/\text{ul}$.
2. Adult dose is one unit/10 Kg body weight (6-8 unites).
3. Pediatric dose: one unit/7-10 Kg body weight.

Administration:

1. Via 150-280 administration set.
2. Transfused within 4 hours.
3. ABO Matched platelets if RBCs $>2\text{ml}$.

Acceptable blood groups of Platelets for transfusion

Same blood group or compatible blood group are preferred but if not available any bloodgroup can be given.

C/ Leukoreduced blood cellular components:

Benefits: to prevent:

01. Febrile non-hemolytic transfusion reaction
02. Allo-immunization to HLA antigens and platelets refractoriness
03. CMV, EBV, and HTLV I/II Transfusion Transmitted Disease
04. Acute Lung Injury and adult respiratory syndrome



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Indications:

01. Multiple PRBCs transfusion patients:
02. Sickle cell disease
03. Beta thalassemia major
04. Leukemia
05. Cancer
06. Hematopoietic stem cell transplant
07. Patients who need CMV negative blood:
08. Infant born to negative CMV mothers
09. Open heart surgery
10. Premature babies
11. Seronegative CMV organ transplant
12. Multiple pregnancy female who need blood
13. Multiple platelets transfusion patients
14. Patients with immune suppression
15. Organ transplants
16. AIDS

D/ Fresh Frozen Plasma

Indication:

1. Patients with active bleeding with prothrombin ratio > 1.2.
2. Patients of liver disease with fibrinogen <100 mg/dl.
3. Massive transfusion with abnormal bleeding.
4. Therapeutic plasmapheresis for:
 - a) Thrombotic thrombocytopenic purpura (TTP).
 - b) Hemolytic uremic syndrome.
5. Rapid reversal of Warfarin or Cumarine overdose (to avoid delay of action of Vit K which need 8-10 h)
6. Liver transplantation.
7. Acute DCT.
8. Congenital & acquired coagulopathies with PT>18 sec, PTT> 60 sec or coagulation factor assay <25%.

9. Hyper coagulopathies:

a) Protein C & protein S deficiency.

b) Antithrombin III. Deficiency.

Conditional Use of FFP:

Presence of bleeding with:

1. Liver disease.
2. Massive blood transfusion

Contraindication:

1. Volume expanders.
2. Nutrition.
3. Wound healing.

Dose:

1. 15-30 ml/kg body weight.
2. One FFP unite reduces PT&PTT to hemostatic normal range.

Administration:

Infusion rate 1-2 ml./min.

Acceptable blood groups of FFP for transfusion

Patient blood group	First choice	Acceptable alternative	Acceptable with approval of medical director
O	O	A, B, AB	
A	A	AB	B or O
B	B	AB	A or O
AB	AB	A	B or O

than overloading patients with unnecessary volume and to avoid sensitization to different elements of blood components.

Description:

1. Very low in factor V and factor VIII.
2. No platelet.
3. Maintain factor I, II, VII&IX.
4. O₂ carrying capacity.
5. Blood volume expansion capacity.

Indication:

1. Patients of active bleeding & loss >30% of blood volume (massive bleeding is 10 unites).
2. Neonatal exchange transfusion (fresh blood).

Contraindication:

Chronic anemia states.

Dose:

1. One unites of WB increases Hb by 1 gm/dl & HCT by 3%.
2. Pediatric: 8 ml/kg. increases Hb 1 gm/dl.

Administration:

1. Good observation includes pulse, temperature, and blood pressure especially during first 15 min.
2. No solutions or medication is given in the same line with transfusion.
3. Infusion rate should be slowly at the start of transfusion & each unite should be transfused within 3-4 hours.
4. Rate of infusion in acute blood loss can be more rapid with the use of blood warmer.

G/ Irradiated cellular blood products

Benefits

Prevent graft versus host disease GVHD

Irradiation dose

X Ray irradiation technology 2500 cGY midpoint or 1500 cGY at any point

Cellular blood products

RBCs, platelets

Indications:



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Indications:

01. Severe immune compromised patients
02. After transplantation of bone marrow or peripheral stem cells
03. Fetal intra uterine transfusion
04. Blood relative transfusion
05. HLA matched platelets
06. Hematological diseases transfusions:
 - Hodgkin disease
 - Non-Hodgkin lymphoma
 - Multiple myeloma
 - All types of leukemia
07. Severe combined immune deficiency syndrome
08. HIV patients
09. Neuroblastoma under chemotherapy
10. Bone marrow depression under antilymphocyte treatment
11. Organ transplant patients under immune suppression treatment

H/ Washed RBCs

Indication:

Prevent recurrent or severe allergic reaction (Ig A deficiency)

Neonatal or intra uterine transfusion

I/ Phenotyped RBCs

Indication:

-multi-transfused patients : SCD, Thalassemia , HDU

-Pediatric patients, candidates for bone marrow transplantation; women in childbearing age

06. Responsibilities :

- 06.1. All Blood Bank Staff of Al-Qunfudah General Hospital.
- 06.2. ALL MEDICAL STAFF

07. Equipment & Forms

Blood Bank Summary Chart of Blood Components

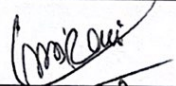
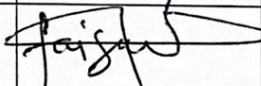
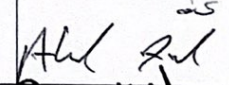
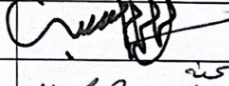
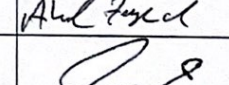
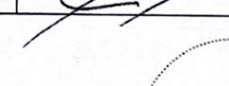
08. Attachment :

N.A

09. Reference

- 09.1. The Technical manual of the American Association of Blood Banks, 2016
- 09.2. The unified practical procedure manual for blood bank in the Arab countries, 2013
- 09.3. Guidelines for benign Hematology, 2013

Preparation , Reviewing & Approval Box

	NAME	POSITION	SIGN & STAMP	DATE
Prepared By	Dr RAJA NACER SASSI	Head of Blood Bank		14/7/1441
Reviewed By	Dr IBRAHIM AWADH	Lab & B. Bank HOD		14/7/1441
Document Reviewed By	Dr FAISAL FALATA	TQM Director		14/7/1441
Approved By	Dr. AHMAD BALBAID	Chairman of blood utilization committee		14/7/1441 10/3/2020
Approved By	Ms. AMRAH ALHILEESI	Nursing director		16/3/2020
Approved By	Dr AHMAD BALBAID	Medical Director		10/3/2020
Approved By	Mr HASSAN ALNASHERI	Hospital Director		11/3/2020

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